



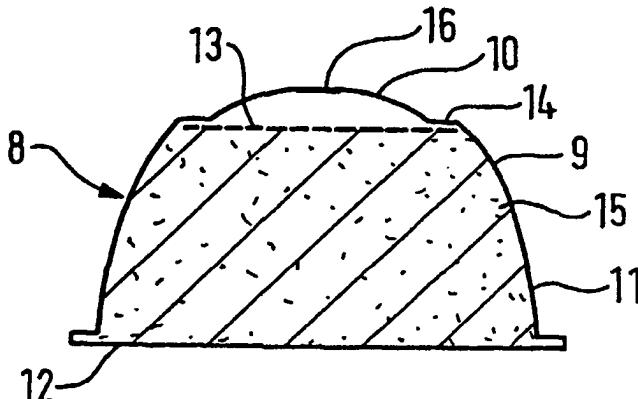
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 7 : B65D 81/34, A47J 31/40	A1	(11) International Publication Number: WO 00/56629 (43) International Publication Date: 28 September 2000 (28.09.00)
(21) International Application Number: PCT/EP00/01752		(81) Designated States: AU, BR, CA, JP, KR, MX, NO, NZ, US, ZA, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).
(22) International Filing Date: 2 March 2000 (02.03.00)		
(30) Priority Data: 99105596.3 18 March 1999 (18.03.99) EP		Published <i>With international search report.</i>
(71) Applicant (for all designated States except US): SOCIETE DES PRODUITS NESTLE S.A. [CH/CH]; P.O. Box 353, CH-1800 Vevey (CH).		
(72) Inventors; and		
(75) Inventors/Applicants (for US only): MASEK, Petr [CH/CH]; Le Verger C, CH-1614 Granges (CH). YOAKIM, Alfred [FR/CH]; Ch. de la Routiaz 2, CH-1806 ST-Legier-La-Chiesaz (CH).		
(74) Agent: THOMAS, Alain; Avenue Nestlé, 55, CH-1800 Vevey (CH).		

(54) Title: SEALED CARTRIDGE FOR MAKING A BEVERAGE

(57) Abstract

The invention relates to a sealed cartridge, provided to be extracted under pressure, containing a substance (15) for preparing a beverage, comprising a dish (9) with a bottom (10) and a side wall (11), having substantially the shape of a frustum of a cone, and a circular edge with a diameter greater than the bottom, and a cover (12) welded to the periphery of the edge of the dish, in which the cover (12) consists of a flexible material which is impermeable to oxygen, chosen from the group consisting of aluminium, an aluminium/plastic composite, an aluminium/plastic/paper composite, pure or multi-layer plastic, the said cartridge not comprising a filter or a weakening zone and the cover being intended to be torn only through the effect of the force of the extraction fluid when extraction starts, the said cartridge comprising, in the dish at the level of the bottom, a means (13) guaranteeing the seal when it is open.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Larvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakhstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LI	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

Sealed cartridge for making a beverage

The present invention relates to a sealed cartridge, provided to be extracted under pressure, containing a substance for the preparation of a beverage chosen from ground roasted coffee, tea, instant coffee, a mixture of ground coffee and of instant coffee, a chocolate-based product or any other dehydrated edible substance, comprising a dish with a bottom and a side wall, having substantially the shape of a frustum of a cone, and a circular edge with a diameter greater than the bottom, and a cover welded to the periphery of the edge of the dish, in which the cover consists of a flexible material which is impermeable to oxygen, chosen from the group consisting of aluminium, an aluminium/plastic composite, an aluminium/plastic/paper composite, pure or multi-layer plastic, the said cartridge not comprising a filter or a weakening zone and the cover being intended to be torn only through the effect of the force of the extraction fluid when extraction starts.

The sealed cartridge described above is the subject of Patent EP 512,468, in the name of the applicant. This cartridge is extracted with the device forming the subject of Patent EP 512,470. This extraction takes place in the following manner: the cartridge is inserted into a cartridge holder and into an extraction cage. This extraction cage comprises a needle which will pierce the bottom of the dish and, when the pressure in the cartridge rises, the cover will bear on protruding and hollowed-out elements of the extraction device. When the pressure reaches a certain level, the cover reaches its rupture tension and it opens, allowing the coffee to flow into the cup. At the end of extraction, it is possible to remove the cartridge from the extraction system in order to place the next one therein. When the said cartridge is removed, there is a hole in the bottom of the dish and this hole allows residual water and coffee grounds to

- 2 -

escape. This leakage of grounds causes a problem, because it soils part of the extraction machine.

The aim of the present invention is to perfect a cartridge provided for the same type of extraction as mentioned above and which does not lead to leaks of grounds or of any other solid substance when the said cartridge is changed.

The present invention relates to a sealed cartridge according to the preamble of Claim 1, which comprises, in the dish at the level of the bottom, a means guaranteeing the retention of solid substance when it is open. This involves arranging, in each cartridge, a non-return system for the coffee grounds or for any other solid substance extracted in the said cartridge. This system must suit the existing construction of the extraction head.

The means guaranteeing the retention of solid substance is chosen from the group consisting of a fabric, a valve and a foam, the said means being placed, adhesively bonded or sealed to the bottom of the said cartridge. The three aforesaid means are firstly acceptable in terms of cost and, secondly, are simple to produce, allow easy opening by the injection needle, are satisfactorily resistant to hot water and provide satisfactory closure after extraction, i.e. when the cartridge is removed.

The fabric used may be any type of fabric, woven or non-woven, made from plastic fibres, from vegetable fibres or from animal fibres. The fabric used is preferably fabric made from polypropylene, polyester or polyurethane having a thickness of between 15 and 100 microns. The fabric is hot-sealed in the bottom of the dish.

The valve used may be of any type, for example a flexible plastic disc with a cross-shaped cut-out, i.e. with four branches. It is also possible to have a valve with a three-branch or six-branch cut-out. The valve may be adhesively bonded or hot-sealed, but it is also possible simply to place it in the bottom of the

- 3 -

dish. This valve is preferably made from polypropylene or polyethylene.

The foam used is made from a flexible plastic, for example from PUR (polyurethane) or EVA (ethylene-vinyl acetate copolymer). It is hot-sealed in the 5 bottom of the dish.

The cover is heat-welded or crimped to the periphery of the dish. A cartridge which can withstand the pressures which may range up to 15 bar in the 10 extraction system is thereby obtained.

The cartridge is filled with a substance for the preparation of a beverage, as mentioned above. This substance is preferably ground roasted coffee.

"Dish" is understood to mean a frustoconical, 15 hemispherical or frustopyramidal element. Naturally, the bottom of the dish does not have to be flat.

The principal body of the cartridge, namely the dish, of frustoconical shape and of semi-rigid nature, may consist of a material chosen from aluminium having 20 a thickness of 20 to 100 µm, a pure or multi-layer plastic, a cardboard/ aluminium/plastic composite and a cardboard/plastic composite.

The cover of the cartridge, of flexible nature, may be made from a material chosen from aluminium with 25 a thickness of 15 to 60 µm and a multi-layer material comprising either paper of 20 to 60 g/m², plastic of a thickness of 20 to 60 µm and aluminium of a thickness of 5 to 20 µm, or EVOH or PVDC of a thickness of 5 to 30 µm and plastic (PP, PE or PA) of 20 to 100 µm, or 30 PET (5 to 30 µm) and plastic (PP, PE) of 20 to 100 µm, or PET that is metallized or equipped with a layer which forms an efficient barrier, such as SiO_x.

The size of the cartridge according to the invention may vary according to the volume of coffee it 35 is desired to prepare. The measure of coffee may vary between 5 and 20 g, the diameter of the cartridge is between 2.5 and 6 cm and the thickness of the bed of coffee between 10 and 40 mm.

- 4 -

The remainder of the description is given with reference to the drawings, in which:

Fig. 1 is a diagrammatic representation of the cartridge according to the state of the art;

5 Fig. 2 is a diagrammatic representation of the cartridge according to the invention, in a first embodiment;

Fig. 3 is a diagrammatic representation of the cartridge according to the invention, in a second
10 embodiment; and

Fig. 4 is a diagrammatic representation of the cartridge according to the invention, in a third embodiment.

15 The cartridge (1) includes a dish (2) with a bottom (5) and a side wall of frustoconical shape (6).

The cartridge contains roasted coffee (3) and it is sealed by means of a cover (4) made from aluminium. This cover is welded to the periphery (7) of the edge of the dish. When extraction takes place, the needle 20 perforates the bottom of the cartridge in the zone A, allowing the extraction liquid to percolate into the coffee. At the end of extraction, the coffee grounds emerge from the opening in the zone A. The aim of the present invention is to prevent this emergence of 25 grounds. To this end, there are at least three different solutions.

The solution of Fig. 2 is to provide a layer of fabric (13) made from polyester in the cartridge (8) having a dish (9) with a bottom (10) and a side wall (11) and a cover (12). This layer is welded to the shoulder (14) of the cartridge. The bed of coffee (15) is deposited on the fabric (13). The advantage of this fabric is that the needle perforates it easily and, at the end of extraction, its flexibility and its 30 elasticity allow it to close again when the said needle is removed from the cartridge and the grounds do not exit via the opening (16). A cartridge guaranteeing satisfactory cleanliness of the extraction system is thus provided.

- 5 -

Fig. 3 provides a second solution in the form of a cartridge with a non-return device. The cartridge (17) comprises a dish (18) with a bottom (19) and side wall (20), together with a cover (21) welded to the periphery (22) of the dish. A valve (23) is adhesively bonded close to the bottom (19). The bed of coffee (24) is deposited on this valve. This valve has, for example, a cross-shaped cut-out, which allows satisfactory opening and satisfactory re-closing when the extraction needle is inserted and removed. It also allows satisfactory retention of the coffee grounds. It is also possible to arrange the valve of Figure 3 in the cartridge of Figure 2 and vice versa and it is possible to weld the layer of fabric of Figure 2 in the cartridge of Figure 3.

Fig. 4, finally, shows a cartridge (25) comprising a dish (26) with a bottom (27) and a side wall (28) and a cover (29). The bottom of the cartridge includes an adhesively bonded layer of foam made from flexible plastic (30). The bed of coffee (31) is deposited on this foam. It is perforated easily and it has a satisfactory re-closing ability when the extraction needle is removed. The foam of Figure 4 may also be arranged in the cartridge according to Figure 3.

Claims

1. Sealed cartridge, provided to be extracted under pressure, containing a substance for the preparation of a beverage chosen from ground roasted coffee, tea, instant coffee, a mixture of ground coffee and of instant coffee, a chocolate-based product or any other dehydrated edible substance, comprising a dish with a bottom and a side wall, having substantially the shape of a frustum of a cone, and a circular edge with a diameter greater than the bottom, and a cover welded to the periphery of the edge of the dish, in which the cover consists of a flexible material which is impermeable to oxygen, chosen from the group consisting of aluminium, an aluminium/plastic composite, an aluminium/plastic/paper composite, pure or multi-layer plastic, the said cartridge not comprising a filter or a weakening zone and the cover being intended to be torn only through the effect of the force of the extraction fluid when extraction starts, characterized in that it comprises, in the dish at the level of the bottom, a means guaranteeing retention of solid substance when it is open.
2. Sealed cartridge according to Claim 1, characterized in that the means guaranteeing the retention of solid substance is chosen from the group consisting of a fabric, a valve and a foam, the said means being placed, adhesively bonded or sealed to the bottom of the said cartridge.
3. Cartridge according to one of Claims 1 or 2, characterized in that the cover is welded or crimped to the edge of the dish.
4. Cartridge according to one of Claims 1 to 3, characterized in that the dish is made from a material chosen from aluminium having a thickness of 20 to 100 µm, a pure or multi-layer plastic, a cardboard/aluminium/plastic composite and a cardboard/plastic composite.

- 7 -

5. Cartridge according to one of Claims 1 to 4, characterized in that the cover is made from a material chosen from aluminium with a thickness of 15 to 60 μm and a multi-layer material comprising either paper of
5 20 to 60 g/m², plastic of a thickness of 20 to 60 μm and aluminium of a thickness of 5 to 20 μm , or EVOH or PVDC of a thickness of 5 to 30 μm and plastic (PP, PE or PA) of 20 to 100 μm , or PET (5 to 30 μm) and plastic (PP, PE) of 20 to 100 μm , or PET that is metallized or
10 equipped with a layer which forms an efficient barrier, such as SiO₂.

6. Cartridge according to one of Claims 1 to 5, characterized in that it has a diameter of between 2.5 and 6 cm and a height of between 10 and 40 mm.

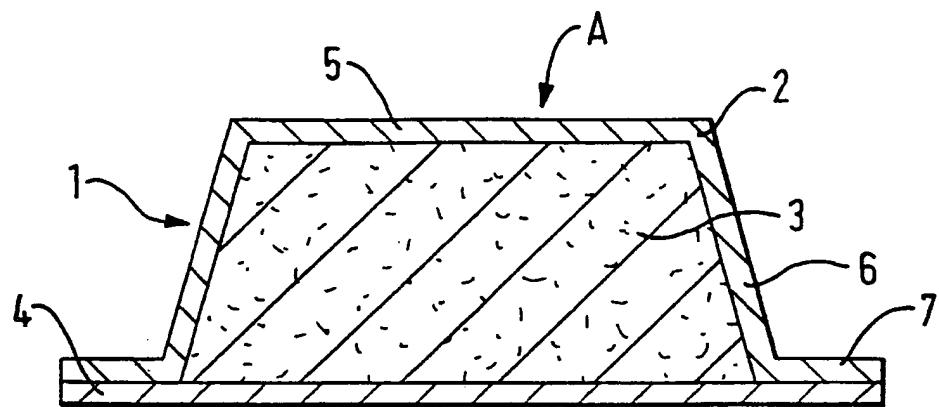


FIG. 1

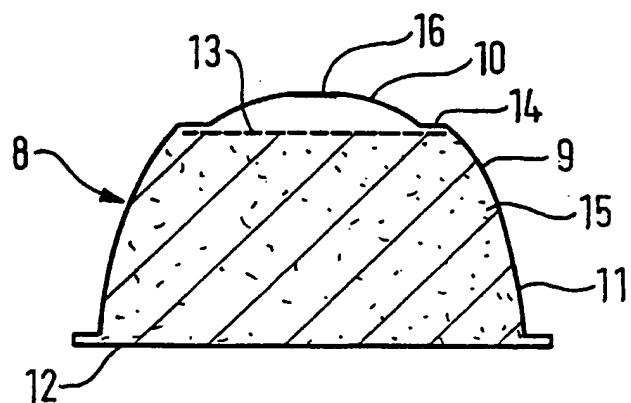


FIG. 2

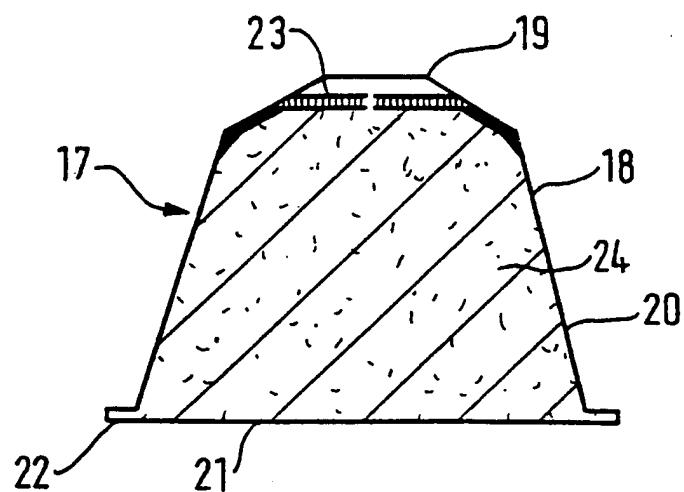


FIG. 3

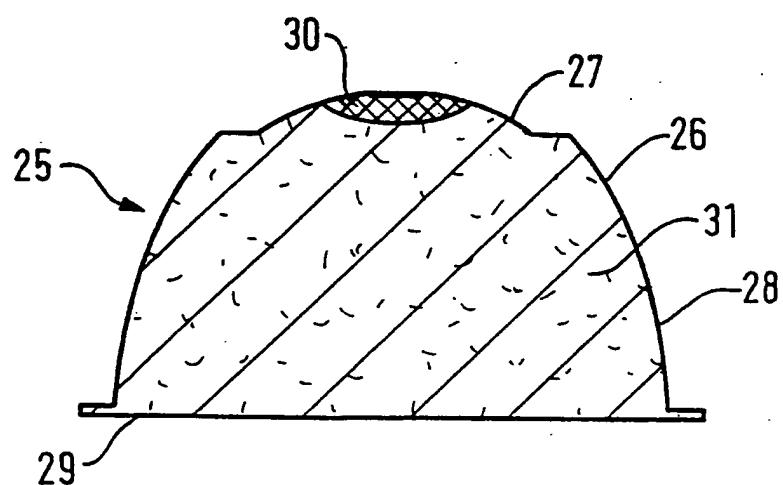


FIG. 4

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 00/01752

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B65D81/34 A47J31/40

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 B65D A47J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	FR 2 668 451 A (COFEA SA) 30 April 1992 (1992-04-30) page 8, paragraph 2 -page 9, paragraph 1 figure 3	1
A	FR 2 373 999 A (NESTLE SA) 13 July 1978 (1978-07-13) page 3, line 12 - line 19 figure 2	1
A	EP 0 512 468 A (NESTLE SA) 11 November 1992 (1992-11-11) cited in the application the whole document	1

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
6 June 2000	14/06/2000
Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentzaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Wennborg, J

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 00/01752

C(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 512 470 A (NESTLE SA) 11 November 1992 (1992-11-11) cited in the application column 13, line 31 -column 15, line 57 figure 3	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

Int'l Application No

PCT/EP 00/01752

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
FR 2668451	A 30-04-1992	AT 400291 B AU 650064 B AU 8720191 A BE 1006165 A CA 2072367 A,C CH 682909 A CH 688686 A WO 9207775 A DE 4192762 T DK 85792 A EP 0507905 A ES 2085823 A GB 2255494 A,B IT 1250066 B JP 8032249 B JP 5502817 T LU 88131 A NL 9120010 T PT 99373 A,B SE 9201946 A US 5472719 A		27-11-1995 09-06-1994 26-05-1992 31-05-1994 01-05-1992 15-12-1993 15-01-1998 14-05-1992 28-01-1993 30-06-1992 14-10-1992 01-06-1996 11-11-1992 30-03-1995 29-03-1996 20-05-1993 15-02-1993 01-10-1992 31-01-1994 24-06-1992 05-12-1995
FR 2373999	A 13-07-1978	CH 605293 A AR 218048 A AT 359423 B AT 873677 A AU 515875 B AU 3141877 A BE 861543 A BR 7708403 A CA 1089801 A DE 2752733 A DE 7736129 U DK 561177 A,B, FI 773625 A,B, GB 1561188 A IT 1133901 B JP 1382008 C JP 60045325 A JP 61051882 B JP 1338647 C JP 53076171 A JP 61002372 B LU 78694 A NL 7713597 A,B, NO 774331 A,B, NZ 185867 A PT 67339 A,B SE 428917 B SE 7714275 A US 4136202 A ZA 7707279 A		29-09-1978 15-05-1980 10-11-1980 15-03-1980 07-05-1981 14-06-1979 06-06-1978 08-08-1978 18-11-1980 22-06-1978 24-02-1983 18-06-1978 18-06-1978 13-02-1980 24-07-1986 09-06-1987 11-03-1985 11-11-1986 29-09-1986 06-07-1978 24-01-1986 17-04-1978 20-06-1978 20-06-1978 27-05-1980 01-12-1977 01-08-1983 18-06-1978 23-01-1979 27-09-1978
EP 0512468	A 11-11-1992	EP 0512148 A DK 512468 T AT 148419 T AU 679825 B AU 1350195 A		11-11-1992 07-07-1997 15-02-1997 10-07-1997 06-07-1995

INTERNATIONAL SEARCH REPORT

Information on patent family members

Inte: onal Application No

PCT/EP 00/01752

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0512468	A	AU 1505192 A CA 2067515 A,C DE 69217113 D DE 69217113 T ES 2097831 T FI 922065 A GR 3022936 T JP 2763987 B JP 5132056 A KR 143975 B MX 9202144 A NO 302696 B NZ 242567 A US 5897899 A ZA 9202989 A	12-11-1992 11-11-1992 13-03-1997 15-05-1997 16-04-1997 11-11-1992 30-06-1997 11-06-1998 28-05-1993 01-08-1998 01-11-1992 14-04-1998 22-12-1994 27-04-1999 30-12-1992
EP 0512470	A 11-11-1992	EP 0512142 A AT 137089 T AU 658407 B AU 1502792 A CA 2068067 A,C DE 69210084 D DE 69210084 T DK 512470 T ES 2087338 T FI 922064 A,B, GR 3020260 T HK 1002695 A JP 2784293 B JP 5130944 A MX 9202123 A NO 921811 A NZ 242524 A US 5897899 A US 5656316 A US 5402707 A ZA 9202778 A	11-11-1992 15-05-1996 13-04-1995 12-11-1992 09-11-1992 30-05-1996 19-09-1996 12-08-1996 16-07-1996 09-11-1992 30-09-1996 11-09-1998 06-08-1998 28-05-1993 01-11-1992 09-11-1992 27-06-1994 27-04-1999 12-08-1997 04-04-1995 30-12-1992